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EPA Superfund
Record of Decision:

SAVANNAH RIVER SITE (USDOE)
EPA ID: SC1890008989
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AIKEN, SC
03/06/1995

United States Department of Energy

Savannah River Site

Interim Action Record of Decision
Remedial Alternative Selection (U)

D-Area Oil Seepage Basin

WSRC-RP-93-1550
Revision 1
January 16, 1995

Westinghouse Savannah River Company

Savannah River Site
Aiken, South Carolina 29808

PREPARED FOR THE U.S. DEPARTMENT OF ENERGY UNDER CONTRACT DE-AC09-89-SR18035

DECLARATION FOR THE RECORD OF DECISION

Unit Name and Location

D-Area Oil Seepage Basin RCRA/CERCLA Unit
Savannah River Site
Aiken County, South Carolina

Appendix C of the Federal Facility Agreement (FFA) lists this Resource Conservation and Recovery Act (RCRA)/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) unit as the D-Area Oil Seepage Basin (Building Number 631-G).

Statement of Basis and Purpose

This document presents the selected interim remedial action for the D-Area Oil Seepage Basin at the Savannah River Site (SRS), which was developed in accordance with CERCLA of 1980, as amended, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This decision is based on the Administrative Record File for this specific RCRA/CERCLA unit.

Assessment of the Unit

The D-Area Oil Seepage Basin unit is located in the southwest portion of SRS. The basin was used for the disposal of waste oil originating from D-Area operations, to dispose of nonburnable waste (drums, paint cans, metal objects, and rubber products), and for the routine burning of office and cafeteria waste. Unknown amounts and types of waste were disposed into the basin.

A unit screening program was completed at the D-Area Oil Seepage Basin in November 1988. In addition, a limited scope sampling event was conducted at the waste unit in 1993. Data collected during both activities indicate the presence of hazardous substances in soils and groundwater at the unit. Accordingly, a RCRA Facility Investigation (RFI)/CERCLA Remedial Investigation (RI) Assessment Program is underway at the unit. In addition to the contaminated soils and groundwater, there are hazardous substances associated with buried drums within the unit. The principal threat source material includes subsurface hazardous liquids including drum contents, pumpable free product, and discernible layers of sludges. If not removed, these substances pose a threat of continued hazardous material release to basin soils resulting in potential further impact to groundwater.

Description of the Selected Remedy

The preferred interim action alternative is Alternative 2, which consists of removal and management of buried drum contents, pumpable free product, and discernible layers of sludge present within the basin, and replacement of excavated soils. Large removable debris would be excavated and dispositioned through the Treatment, Storage, and Disposal Facility (TSDF) operated by the SRS Solid Waste and Environmental Restoration (SW&ER) Division. All hazardous wastes generated during the interim action will be dispositioned through an SRS facility that complies with the Off-Site Rule (58 FR 49200).

Declaration Statement

This interim action is protective of human health and the environment, complies with Federal and South Carolina applicable or relevant and appropriate requirements (ARARs) directly associated with this limited scope action, and is cost-effective. The interim action involves no treatment of affected soils or groundwater. However, disposition of the buried waste material and debris excavated as part of the interim action, which may involve treatment, would be managed through the SRS TSDF operated by SW&ER following approved methods and procedures. All applicable Federal and state regulations will be followed. Since this action does not constitute the final remedy for the D-Area Oil Seepage Basin waste unit, the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element, although partially addressed in this remedy, will be addressed by the final response action. Subsequent actions are planned to address fully the threats posed by the conditions at this unit. Since this is an Interim Action Record of Decision, review of this unit and of this remedy will be ongoing through implementation of the RFI/RI required in accordance with the terms of the FFA as the U.S. Department of Energy, the U.S. Environmental Protection Agency, and the South Carolina Department of Health and Environmental Control continue to develop final remedial alternatives for the D-Area Oil Seepage Basin.

Date

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Date

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INTERIM ACTION RECORD OF DECISION
D-AREA OIL SEEPAGE BASIN

I. Site and Operable Unit Name, Location, and Description

The Savannah River Site (SRS) occupies approximately 310 square miles adjacent to the Savannah River, principally in Aiken and Barnwell Counties of South Carolina (Figure 1). SRS is a secured facility with no permanent residents. The Site is approximately 25 miles southeast of Augusta, Georgia, and 20 miles south of Aiken, South Carolina. According to 1990 census data, the average population densities (in people/square mile) for the surrounding South Carolina counties are 111 for Aiken County, 36 for Barnwell County, and 28 for Allendale County, and for the surrounding Georgia counties are 228 for Columbia County, 524 for Richmond County, 25 for Burke County, and 21 for Screven County. The population within a 50-mile radius of SRS is 635,000 people.

SRS is owned by the U.S. Department of Energy(DOE). Westinghouse Savannah River Company (WSRC) provides management and operating services for DOE. SRS has historically produced tritium, plutonium, and other special nuclear materials for national defense. The Site has also provided nuclear materials for the space program, and for medical, industrial, and research efforts. Chemical and radioactive wastes are byproducts of nuclear material production processes. Hazardous substances, as defined by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), are currently present in the environment at SRS. Appendix C of the Federal Facility Agreement (FFA, 1993) lists the D-Area Oil Seepage Basin waste unit (Building 631-G) as a Resource Conservation and Recovery Act (RCRA)/CERCLA unit.

The D-Area Oil Seepage Basin waste unit is located in the southwest portion of SRS

between unimproved dirt Roads A-4.4 and A-4.5, approximately one mile north of the coal-fired D-Area Powerhouse (Figures 1 and 2) and approximately 1.9 miles from the nearest SRS boundary. For purposes of this interim action, the D-Area Oil Seepage Basin operable unit is defined as the proposed remedial action radionuclides were disposed within the trenches (Plunkerr, 1993).

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that would result in the removal of suspected drum contents and large debris within the waste unit. This operable unit or discrete action will allow for further characterization of the entire waste unit.

The D-Area Oil Seepage Basin is located at an elevation of approximately 150 feet above mean sea level (Figure 2). Physiographically, the basin is located on the Ellenton Plain, the highest of three terraces between the Savannah River to the west and the Aiken Plateau to the east (Huber, Johnson, and Bledsoe, 1987). The closest surface water feature is a Carolina bay, a natural wetland, located approximately 175 feet west of the unit. The Carolina bay appears to be dry during the summer months or periods of little or no precipitation, but may contain surface water during wet seasons. The major surface water drainage system is the Savannah River and associated swamps, located approximately 1.3 miles to the west of the basin (Figure 1). Upper Three Runs Creek is located 1.7 miles to the north-northwest; Fourmile Branch is 1.7 miles to the south-southeast.

II. Operable Unit History and Compliance History

Operable Unit History

Construction of the D-Area Oil Seepage Basin trenches began in 1952. Employee interviews indicated the basin was used in the disposal of waste oil originating from D-Area Powerhouse operations (Huber et al., 1987; Plunkett, 1993), to dispose of nonbumable waste (drums, paint cans, metal objects, and rubber products), and for the routine burning of office and cafeteria waste. Unknown amounts and types of waste were disposed into the basin.

No historical evidence of overflow of the basin exists. Records of the contents of the disposed drums do not exist. To date, there is no evidence to indicate the presence of radionuclides in the drums. Furthermore, employee interviews have indicated that no

In 1975; the D-Area Oil Seepage Basin was removed from service and backfilled with soil (WSRC, 1990). Approximately one foot of standing liquid, plus an unknown number of 55-gallon drums possibly containing waste oil, remained in the basin when it was backfilled. The basin remains inactive and is covered with natural vegetation, including bushes and grasses, and is surrounded by trees.

Compliance History

Waste materials are managed at SRS that are regulated under RCRA. Certain SRS activities have required Federal operating or post-closure permits under RCRA. SRS received a hazardous waste permit from the South Carolina Department of Health and Environmental Control (SCDHEC) on September 30, 1987. On December 21, 1989, SRS was placed on the National Priorities List (NPL). A site placed on the NPL comes under the jurisdiction of CERCLA. In accordance with Section 120 of CERCLA, DOE has negotiated a Federal Facility Agreement (FFA, 1993) with the U.S. Environmental Protection Agency (EPA) and SCDHEC to coordinate cleanup activities at SRS into one comprehensive strategy that fulfills RCRA Section 3004(u) and CERCLA assessment, investigation, and response action require-ments. The FFA lists the D-Area Oil Seepage Basin as a RCRA/CERCLA unit requiring further evaluation using an investigation/ assessment process that integrates and combines the RFI with the CERCLA Remedial Investigation (RI) to determine the actual or potential impact to human health and/or the environment. This action is being carried out in accordance with the requirements of the FFA and the state and Federal RCRA permits.

The D-Area Oil Seepage Basin is listed as a Solid Waste Management Unit (SWMU) under both state and Federal RCRA permits. The provisions of these permits require investigation and implementation of corrective measures, as necessary, for releases of hazardous constituents from SWMUs. The permits also provide for implementation of interim measures to stabilize SWMU releases.

A unit screening program was completed at the D-Area Oil Seepage Basin in November 1988 (WSRC, 1990). In addition, a limited scope sampling event was conducted at the waste unit in 1993. Data collected indicate the presence of hazardous substances in soils and groundwater at the unit. Accordingly, an RFI/RI Assess-ment Program is required at the waste unit. In addition to the contaminated soils and groundwater, there ave hazardous substances associated with buried drums within the unit. If not removed, these buried drums pose a threat of contained hazardous material release to basin soils resulting in potential further impact to groundwater.

For remedial purposes, the D-Area Off Seepage Basin (corner boundary coordinates: E23995, N68604; E23886, N68136; E23400, N68732; E23127, N68306; see Figure 2), as bounded by the markers, should be considered the waste unit area. The area to be excavated, shown on Figure 2, represents the location of suspected and specific waste disposal activities.

III. Highlights of Community Participation

Public participation requirements are listed in Sections 113 and 117 of CERCLA. These requirements include the establishment of an Administrative Record File that documents the selection of cleanup alternatives and provides for review and comment by the public of those alternatives. The SRS public involvement plan (DOE, 1994) is designed to facilitate public involvement in the decision making processes for permitting, closure, and the selection of remedial alternatives. The PIP addresses the requirements of RCRA, CERCLA, and the National Environmental Policy Act (NEPA). Section 117(a) of CERCLA, 1980, as amended, requires the preparation of a proposed plan as part of the site remedial process. The Interim Action Proposed Plan (IAPP) (WSRC, 1994) for the D-Area Oil Seepage Basin, which is part of the Administrative Record File, highlights key aspects of the assessment and investigation phases of the remediation process and identifies the preferred interim action alternative for

remediation of the D-Area Oil Seepage Basin.

The Administrative Record File, which contains the information upon which the selection of the response action was made, was made available at the EPA-Region IV office and at the following locations:

U.S. Department of Energy
Public Reading Room
Gregg-Graniteville Library
University of South Carolina-Aiken
171 University Parkway
Aiken, South Carolina 29801
(803) 641-3465

Thomas Cooper Library
Government Documents Department
University of South Carolina
Columbia, South Carolina 29208
(803) 777-4866

Similar information was made available through the following repositories:

Reese Library
Augusta College
2500 Walton Way
Augusta, Georgia 30910
(404) 737-1744

Asa H. Gordon Library
Savannah State College
Tompkins Road
Savannah, Georgia 31404
(912) 356-2183

The public was notified of the comment period for the D-Area Oil Seepage Basin through mailings of the SRS Environmental Bulletin, a newsletter sent to more than 1400 citizens in South Carolina and Georgia, and through notices in the Aiken Standard, the Allendale Citizen Leader, the Barnwell County Banner, the Barnwell People-Sentinel, the North Augusta Post, The State, and the Augusta Chronicle newspapers.

The 30-day public comment period began on August 15, 1994 for the IAPP for the D-Area Oil Seepage Basin operable unit. The public comment period was extended for 30 days until October 13, 1994. A public meeting was held on October 11, 1994. Written and oral comments were accepted during this meeting. Responses to comments are discussed in the Responsiveness Summary (Appendix B).

IV. Scope and Role of Operable Unit within the Site Strategy

This interim action addresses only the remediation of the source material within the D-Area Oil Seepage Basin waste unit. The discrete action constitutes the first part of the proposed strategy which would address the principal threats posed by the waste unit. The overall strategy of remediating the D-Area Oil Seepage Basin waste unit is to: (1) perform the proposed interim remedial action described herein; (2) further characterize the waste unit delineating the nature and extent of contamination and identifying the media of concern; (3) perform a baseline risk assessment to evaluate media of concern, chemicals of concern, exposure pathways and characterize potential risks; and (4) evaluate and perform a final action to remediate the identified medium(s) of concern. The objectives in developing interim remedial alternatives were to evaluate interim actions that would address the principal threat source material, subsurface hazardous liquids including drum contents, pumpable free product, debris, and discernible layers of sludges. The alternatives would result in buffed drum content removal, to prevent potential further releases, and provide a drum- and debris-free environment for future unit assessment studies. Providing a drum-free environment and removing the large debris will allow the RFI/RI characterization studies to proceed more easily and safely and allow subsequent development of final remedial alternatives. Following the performance of this interim action, further characterization, and a risk assessment, a final action(s) will be evaluated which addresses residual risk or contamination. Additionally, a modification to the Hazardous and Solid Waste Act/RCRA permit will be accomplished during the final action for the D-Area Oil Seepage Basin.

V. Summary of Operable Unit Characteristics

Based on employee interviews, the D-Area Oil Seepage Basin was constructed as at least three separate unlined trenches, each divided by berms. Approximate basin boundaries (Figure 2) were determined by ground-penetrating radar (GPR) in 1988 and 1992 and magnetometer surveys in 1993. The three suspected disposal trenches have total approximate dimensions of 383 feet long, 108 feet wide, and 8 feet deep. Two additional areas of disturbed soil were identified by GPR and magnetometer measurements. The westernmost disturbed soils area has approximate dimensions of 100 feet long by 50 feet wide. The easternmost disturbed soils area is approximately 75 feet long by 65 feet wide (Figure 2).

Numerous buried drums and other material were detected in the basin through GPR and magnetometer studies. The drums have been buried at least 17 years; therefore, their condition is questionable. Visual inspection of the drums has not been attempted. It is assumed that intact drums (if any) may contain free liquids and/or residual sludges. However, until the drums are excavated this cannot be verified.

The field geologic log associated with soil sampling conducted in 1989 described the occurrence of oil and the following additional materials in soils collected within the basin: ash, fired glass, burned soil, metal strips and tubing, metal wire, electrical cable, asphalt, concrete fragments, and lumber.

The soil types in and adjacent to the D-Area Oil Seepage Basin waste unit have been identified as fluvaquents (frequently flooded), Udorthents, friable substratum, and Blanton sand (WSRC, 1990). According to work conducted by the U.S. Army Corps of Engineers (COE) in 1952, the D-Area Oil Seepage Basin is located on alluvial deposits of Pleistocene age underlain by Tertiary age deposits (McBean and Congaree Formations). The alluvial sands, silts, and clays are approximately 20 to 39 feet thick (Huber et al., 1987). No detailed geologic information is available for the area surrounding the basin.

As a preliminary effort to characterize the geologic and hydrologic conditions and to monitor the water table elevation and groundwater in the vicinity of the basin, three monitoring wells (DOB-1,-2, and-3) were installed in 1983 (WSRC, 1990). A fourth well, DOB-4, was installed in 1984 (Figure 2).

Data collected from the four DOB wells at the D-Area Oft Seepage Basin waste unit show that the water table depth at this location varies from approximately 4 to 20 feet bls, indicating occasional saturated conditions within the basin. Horizontal water table gradients between wells and across the unit vary from 0 to 0.017 ft/ft based upon 1987 and 1988 data (WSRC, 1990). The average horizontal gradient is 0.0033 ft/ft. Potentiometric maps of the water table at the basin indicate that groundwater flow is often to the west-southwest toward the Carolina bay. However, groundwater elevation data from 1984 through 1989 indicate that the water table flow direction changes, and at times, the flow is toward the east-northeast. This does not appear to be a seasonal variation in groundwater flow.

SRS Health Protection Department surveys were performed in 1991 and 1993 at the D-Area Oil Seepage Basin waste unit, and detected no radioactivity above background (WSRC, 1990).

Average annual temperature at the SRS is approximately 70°F (WSRC, 1990). Average annual rainfall is approximately 43 inches.

In 1988, as part of an RFI/RI unit screening program conducted at the D-Area Oil Seepage Basin waste unit, three boreholes were drilled through the basin fill to the water table (WSRC, 1990). Debris was encountered during this drilling activity and a drum was punctured. Drilling was halted upon encountering the drum. Liquid from the drum was removed and analyzed. The detected compounds included 1,1-dichloroethylene, trichloroethylene, tetrachloroethylene, 2-methylnaphthalene, fluorene, naphthalene,

phenanthrene, n-nitrosodiphenylamine, 4-methyl-2-pentanone, acetone, ethylbenzene, toluene, styrene, xylenes, and methylene chloride (Table 1).

The primary contaminants detected in soils collected from beneath the D-Area Oil Seepage Basin waste unit in 1988 were metals, volatile organic compounds, semi-volatile organic compounds, and low levels of dioxins (WSRC, 1990). Only one soil sample was analyzed for metals. Metals found in concentrations greater than analytical method detection limits were silver, arsenic, barium, chromium, copper, mercury, nickel, lead, antimony, vanadium, and zinc (Table 1).

Several volatile and semi-volatile organic constituents were detected in at least one soil sample during the 1988 screening program (Table 1; WSRC, 1990). Many of these substances are fractional distillation products of crude or coal tar oils and are components in waste oil (e.g., methyl-naphthalene, chrysene, fluoranthene, fluorene, toluene, naphthalene, phenanthrene, pyrene, and xylenes). Bis(2-ethylhexyl)- phthalate was frequently detected in the soil samples at elevated concentrations. Phthalate species are used as plasticizers for cellulose, glass, plastic, and rubber products. Other substances detected, such as 4-methyl-2-pentanone, acetone, methylene chloride, ethylbenzene, and n-nitrosodiphenylamine, are commonly used as solvents. Styrene, which was detected in the buried drum sample, is generally used in resins or protective coatings. Acetone and methylene chloride were also detected frequently at low to moderate concentrations in the soil samples, but, because these constituents were also detected in quality assurance/quality control samples and are common laboratory contaminants, these detections may be artifacts of the laboratory process.

EPA has proposed corrective action requirements for SWMUs at facilities implementing corrective action under Section 3004(u) of RCRA (55 FR 30798; July 27, 1990). The proposed rules create a new Subpart S in the RCRA Part 264 regulations that would define requirements for conducting remedial investigations, evaluating potential remedies, and selecting and implementing remedies at RCRA facilities. The corrective action process under RCRA Subpart S would parallel the process established for remedial actions under CERCLA. Under the proposed rules, EPA establishes action levels for certain constituents that may trigger performance of a Corrective Measures Study (CMS). Action levels are media-specific, health- and environmental-based levels determined by EPA as indicators for protection of human health and the environment. Where appropriate, action levels are based on promulgated standards such as maximum contaminant levels (MCLs) for drinking water. Table 2 compares the analytical results of soil samples collected during 1988 from the three soil borings at the unit and the proposed Subpart S action levels, if available. The comparison of constituent concentrations to promulgated and proposed regulatory levels and background concentrations is provided to give a relative indication of potential chemicals of concern. No constituent detected in unit soils exceeds the proposed action levels. Table 2 also provides a comparison of unit soil metals concentrations with SRS-wide background levels of metals in soils. The comparison indicates that antimony, chromium, copper, lead, and nickel exceed the site-wide ranges for those constituents.

Radionuclide indicators (gross alpha, gross beta, total radium, and tritium) were analyzed in two sod samples (WSRC, 1990) and, at a later date, the liquid from the buried drum sample. No radionuclide indicators were detected in the soil or the drum sample.

A limited scope sampling event at the D-Area Oil Seepage Basin waste unit was conducted on September 28-30, 1993. The primary objective of the sampling was to confirm the presence or absence of harmful levels of dioxins and furans underneath the basin bottoms. The data generated was also used to further delineate the horizontal and vertical extent of contamination from the 1988 unit screening. Additionally, the data generated will be used to develop a site-specific health and safety plan which will help protect workers during excavation activities.

Table 1. Analytical results from sampling of three boreholes and a buried drum at the D-Area Oil Seepage Basin waste unit from the 1988 field screening.

Core	DOSB-01			DOSB-02			DOSB-03			
Interval No.	01	02	02S	02	03	04	00	01D	02	03
Depth, ft	11-12'	16-18'	16-18'	6-7'	7-9'	18-20'	Drum(µg/l)	8-10'	16-18'	8-10'
Organics, µg/kg										
2-Methylnaphthalene	ND	ND	ND	ND	2200	ND	73,000	16,000	1200	5900
Chrysene	ND	ND	ND	ND	400	ND	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND	ND	ND	ND	70	ND	ND
Fluorene	ND	ND	ND	ND	ND	ND	2300	140	ND	60
Naphthalene	ND	ND	ND	ND	ND	ND	28,000	290	40	ND
Pyrene	ND	ND	ND	ND	ND	ND	ND	70	ND	50
Phenanthrene	ND	ND	ND	ND	ND	ND	4800	390	40	150
Bis(2-ethylhexyl)phthalate	59	2	ND	ND	1400	430	ND	13,000	90	2200
n-Nitrosodiphenylamine	ND	ND	ND	ND	ND	ND	3500	420	ND	ND
4-Methyl-2-pentanone	ND	15	ND	ND	ND	ND	4,400,000	ND	ND	ND
Acetone	150	45	ND	43	160	460	1,200,000	480	170	450
Ethylbenzene	ND	ND	ND	ND	ND	ND	570,000	94	ND	120
Toluene	130	32	ND	35	170	110	1,400,000	150	110	140
Styrene	ND	ND	ND	ND	ND	ND	62,000	ND	ND	ND
Xylenes	ND	ND	ND	ND	ND	ND	3,400,000	ND	ND	940
Methylene chloride	160	16	11	45	210	150	1,400,000	150	56	120
Metals, mg/kg										
Silver				0.94			26			
Arsenic				0.72			ND			
Barium				54.00			13			
Chromium				194.00			49			
Copper				122.00			32			
Mercury				0.23			0.21			
Nickel				17.00			ND			
Lead				183.00			6			
Antimony				23.00			ND			
Vanadium				2.80			ND			
Zinc				116.00			33			

S An "S" extension to the internal number indicates a split sample
D A "D" extension to the internal number indicates a duplicate sample
ND Not detected (below analytical detection limits)

Table 2. Range of soil concentrations of organic and metal constituents determined from 1988 sampling at the D-Area Oil Seepage Basin waste unit, compared with proposed RCRA soil action levels and SRS soil background levels.

CONSTITUENT	Soil Sample Concentration Minimum	Maximum	EPA Action Level1	SRS Soil Background Levels2
ORGANICS, mg/kg				
2-Methylnaphthalene	ND	16.00	NA	NA
Chrysene	ND	0.40	NA	NA
Fluoranthene	ND	0.07	NA	NA
Fluorene	ND	0.14	NA	NA
Naphthalene	ND	0.29	NA	NA
Pyrene	ND	0.07	NA	NA
Phenanthrene	ND	0.39	NA	NA
Bis(2-ethylhexyl)phthalate	ND	13.00	50	NA
n-Nitrosodiphenylamine	ND	0.42	100	NA
4-Methyl-2-pentanone	ND	0.02	NA	NA
Acetone	ND	0.48	8000	NA
Ethylbenzene	ND	0.12	8000	NA
Toluene	ND	0.17	20,000	NA
Styrene	ND	ND	20,000	NA
Xylenes	ND	0.94	200,000	NA
Methylene Chloride	0.01	0.21	90	NA
METALS, mg/kg				
Silver	0.94	0.94	200	0.01 - 1.80
Arsenic	0.72	0.72	80	<0.50- 15.20
Barium	54.00	54.00	NA	0.94 - 77.40
Chromium (total)	194.00	194.00	4003	1.31 - 105.10
Copper	122.00	122.00	NA	0.36 - 14.12
Mercury	0.23	0.23	20	<0.01 - 0.89
Nickel	17.00	17.00	2000	0.11 - 17.90
Lead	183.00	183.00	5004	<1.00 - 16.67
Antimony	23.00	23.00	30	5.53- 15.20
Vanadium	2.80	2.80	NA	3.61 - 72.11
Zinc	116.00	116.00	NA	1.80 - 267.00

1 EPA Proposed Corrective Action Rule for Solid Waste Management Units, 40 CFR § 264.521, Appendix A; 55 FR 30798, July 27, 1990.
2 Looney et al., 1990
3 Published action level for chromium (Cr) is for the Cr+6 oxidation state (hexavalent form).
4 EPA, 1989b
NA Not available
ND Not detected (below analytical detection limits)

Fifteen soil borings were conducted during this sampling event (Figure 3). The borings were strategically located at known disturbed areas and at the interface of basin bottoms and sidewalls. Twelve of these borings collected soil samples from 2-4, 6-8 and 12-14 feet bls. Three borings were hand augered (for safety purposes) directly into the basin bottom and soil samples were collected from 2-4 and 6-8 feet bls. This resulted in a total of 57 discrete samples collected including quality control samples.

The analytical suites selected for this sampling event included radionuclide indicators, dioxin and furan homologues, and the target compound list, target analyte list and library scan for tentatively identified compounds.

The geological field logs indicated that oil stained soils were evident in almost every boring and in some samples to at least 14 feet bls (the last interval sampled). Ash, burned soil, wire, cable, rusted metal objects, concrete, insulation, aluminum foil, plastic sheeting and cloth were found in the drill cuttings at a number of locations. Several shallow borings had to be abandoned and re-located because buried debris prevented the hand auger from penetrating basin soils. One boring, in particular, emitted a strong odor of anaerobic decomposition indicating the possibility of natural biodegradation.

The 1993 limited scope sampling detected a wide variety of organic and inorganic contaminants in basin soils, primarily in the sampling intervals of 6-8 feet and 12-14 feet bls. The predominant organic contaminants detected in the sampling, pesticides, PCBs and the congeners dibenzo-p-dioxin and dibenzo-p-furan, are all characterized by being immobile and persistent in the environment.

The most toxic compound detected was 2, 3, 7, 8-tetrachlorodibenzo-p-furan which was present in two of the 57 samples. The most commonly detected organic contaminant was octochloro-dibenzo-p-dioxin which was present in 37 of 57 samples.

Also identified were organic substances

identified as fractions of oil and oil compounds

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including benzene, toluene, ethylbenzene, xylene and naphthalene. The sampling also detected low concentrations of the solvent trichloroethylene and tetrachloroethylene. Analytes with concentrations greater than method detection limits are summarized in Table 3.

Based upon observations in the field and analytical results from the unit screening and additional limited sampling, hazardous substance contamination at the D-Area Oil Seepage Basin waste unit extends from the bottom of the basin at least 18 feet bls. In one borehole, a bailed groundwater sample produced a film of free product floating on the surface.

Monitoring well (DOB-1, -2, -3, and -4) analytical results from 1984 to 1989 indicate trichloroethylene and vinyl chloride groundwater concentrations exceeding Safe Drinking Water Act maximum contaminant levels (MCLs; WSRC, 1990). Iron and manganese groundwater concentrations exceeded the Secondary Drinking Water Standards. Additional groundwater data from 1989 to 1992 indicate the above constituents continue to be detected.

The trenches at D-Area Oil Seepage Basin waste unit, in total are approximately 383 feet long, 108 feet wide, and 8 feet deep. The volume of material within these trenches, based solely on these dimensions, would be approximately 12,300 cubic yards. Based on interviews with site personnel, over 100 drums primarily containing waste oil have been disposed in the basin (WSRC, 1990). The volume of buried debris is assumed to equal 20 percent of the basin volume or 2500 cubic yards, leaving approximately 9800 cubic yards of soil. The westernmost disturbed soil are identified by GPR and magnetometer surveys is approximately 100 feet long by 50 feet wide, and the easternmost area is 75 feet long by 65 feet wide. It is not known whether waste materials are present in these areas, and, accordingly, no specific waste volumes are estimated. However, assuming a depth of disturbance similar to the depth of the trenches, the total volume of material within the disturbed

Table 3. Analytical results from soil sampling at the D-Area Oil Seepage Basin waste unit during 1993.

ACTION LEVELS

Analyte, mg/kg	Hits	Mean	Minimum	Maximum	RCRA Subpart S ♦	PRG for Soil mg/kg (chronic)	PRG for Soil mg/kg (systemic)
ORGANICS							
2-Methylnapthalene	6/57	1.10	0.163	1.65	!	!	!
Benzene	2/57	0.02	0.0119	0.0288	24	22.12	!
Benzo(g,h,i)perylene	1/57	0.27	0.273	0.273	!	!	!
alpha-Chlordane	1/57	0.00263	0.00263	0.00263	0.5	!	!
gamma-Chlordane	1/57	0.00338	0.00338	0.00338	0.5	!	!
Total chlordane	2/114	0.00601	0.003	0.016	0.5	0.49	16.47
Chloroethene	1/57	0.00373	0.00373	0.00373	0.3684	0.338	!
4,4'-DDE	5/57	0.015456	0.00908	0.0256	2	1.89	
4,4'-DDT	4/57	0.008613	0.0014	0.0208	2	1.89	137.22
Dieldrin	12/57	0.02	0.00531	0.0832	0.04	0.04	13.72
Heptochlorodibenzo-p-dioxin	13/57	0.002623	0.0001	0.016	!	!	!
Hexachlorodibenzo-p-dioxin	6/57	0.0059	0.0001	0.019	0.0001	0.000103485	!
Octochlorodibenzo-p-dioxin	37/57	0.004197	0.0001	0.03	0.0047 +	!	!
Pentachlorodibenzo-p-dioxin	2/57	0.0039	0.0031	0.0047	!	!	!
Tetrachlorodibenzo-p-dioxin	2/57	0.001	0.0005	0.0015	!	!	!
Ethylbenzene	9/57	0.013691	0.00252	0.0415	8000	!	27,443.61
2,3,7,8-Tetrachlorodibenzo-p-furan	2/57	0.0002	0.0001	0.0003	0.00005 +	!	!
Heptachlorodibenzo-p-furan	3/57	0.000833	0.0004	0.0013	!	!	!
Hexachlorodibenzo-p-furan	5/57	0.00036	0.0001	0.0009	!	!	!
Octochlorodibenzo-p-furan	1/57	0.0004	0.0004	0.0004	!	!	!
Pentachlorodibenzo-p-furan	3/57	0.000833	0.0004	0.0014	!	!	!
Tetrachlorodibenzo-p-furan	2/57	0.0005	0.0002	0.0008	!	!	!
alpha-Hexachlorocyclohexane (lindane)	2/57	0.0095	0.003	0.016	0.1	0.10	!
beta-Hexachlorocyclohexane (lindane)	1/57	0.00263	0.00263	0.00263	4	0.36	!
Naphthalene	5/57	0.58	0.247	1.79	!	!	10,977.44
Bis(2-ethylhexyl)phthalate	2/57	0.11	0.111	0.113	50	45.83	5,488.72
n-Butylbenzyl-phthalate	1/57	0.10	0.0998	0.0998	!	!	54,887.22
PCB 1254	2/57	1.13	1.01	1.25	!	!	!
PCB 1260	4/57	0.86	0.148	1.22	!	!	!
Total polychlorinated biphenyls	6/114	0.95	0.148	1.25	0.09	0.08	!
Tetrachioroethylene	10/57	0.14	0.00416	0.462	10	!	!
Toluene	9/57	0.04	0.00293	0.104	20,000	!	54,887.22
Trichloroethylene	6/57	0.08	0.00361	0.356	60	!	
Xylene, mixture	9/57	0.0493	0.0126	0.12	200,000	!	548,872.18

Table 3 (cont'd). Analytical results from soil sampling at the D-Area Oil Seepage Basin waste unit during 1993.

Analyte, mg/kg TOTAL METALS	Hits	Mean	Minimum	Maximum	RCRA Subpart S ♦	ACTION LEVELS PRG for Soil mg/kg (chronic)	 PRC for Soil mg/kg (systemic)
Aluminum	57/57	6005.667	489	14,400	!	!	!
Antimony	1/57	8.4	8.4	8.4	3000	!	109.77
Arsenic	15/57	2.137	1.1	5.3	0.4	0.37	82.33
Barium	31/57	166.423	21.3	2380	5600	!	19,210.53
Cadmium	2/57	2.6	2.5	2.7	40	!	!
Calcium	5/57	4862	1220	9320	!	!	!
Chromium	57/57	7.946	1.2	45.4	400 *	!	1,372.18
Cobalt	3/57	16.933	10.2	26	!	!	!
Copper	35/57	45.943	2.7	617	2960	!	10,154.14
Iron	57/57	6870.68	142	140000	!	!	!
Lead	57/57	11.628	0.35	210	500	!	!
Magnesium	4/57	3842.5	1150	7650	!	!	!
Manganese	55/57	64.92	2.7	1710	!	!	!
Mercury	46/57	0.066	0.023	0.318	24	!	82.33
Nickel	6/57	34.15	5.2	62.2	1600	!	5,488.72
Silver	1/57	2.2	2.2	2.2	400	!	1,372.18
Vanadium	27/57	16.385	5.4	55.4	560	!	1,921.05
Zinc	56/57	70.507	2.5	1530	24,000	!	82,330.83

* Chromium (VI)

SOIL BACKGROUND Analyte, mg/kg TOTAL METALS	Looney ∞			Unit-Specific Background		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Aluminum	11,697.41	715.00	53,530.00	10,110.00	4,440.00	13,700.00
Antimony	<10.6	5.53	15.20	!	!	!
Arsenic	<2.0	<0.50	15.20	!	!	!
Barium	16.43	0.94	77.40	24.00	24.00	24.00
Cadmium	<.60	0.12	1.19	!	!	!
Calcium	!	!	!	!	!	!
Chromium	16.41	1.31	105.10	13.35	4.10	17.90
Cobalt	<1.50	0.46	5.27	!	!	!
Copper	3.94	0.36	14.12	5.87	5.30	6.30
Iron	13,341.32	885.90	79,600.00	14,587.50	2,950.00	22,500.00
Lead	5.14	<1.0	16.67	2.40	1.40	3.20
Magnesium	133.76	12.87	759.40	!	!	!
Manganese	27.71	<1.6	498.20	16.60	7.40	26.40
Mercury	<.1	<0.01	0.89	0.05	0.04	0.06
Nickel	4.12	0.11	17.90	!	!	!
Silver	<1.00	0.01	1.80	!	!	!
Vanadium	27.80	3.61	72.11	33.40	6.20	48.30
Zinc	12.39	1.80	267.00	6.13	4.50	7.70

Table 3 (cont'd). Analytical results from soil sampling at the D-Area Oil Seepage Basin waste unit during 1993.

RADIOACTIVE SCREENING Analyte, PCG Radiation Indicators	Looney ∞ Mean	Looney ∞ Minimum	Looney ∞ Maximum	D-Area Oil Seepage Basin Samples Mean	D-Area Oil Seepage Basin Samples Minimum	D-Area Oil Seepage Basin Samples Maximum
Gross alpha	5.25	<4.0	20.00	8.33	1.40	35.90
Non-volatile beta	7.78	<5.0	23.00	10.71	3.10	40.70
Tritium	NA	NA	NA	21.68	2.83	42.70

♦ All action levels were calculated based upon the recommended exposure assumptions and formulas (listed below) in Subpart S, Federal Register, Vol. 55, No. 145, Appendix D, July 27, 1990.

\+ Calculated values utilizing EPA, 1989a

∞ Looney et al., 1990

areas would amount to approximately 3000 cubic yards. Therefore, the total volume to be excavated in the interim remedial action would amount to 15,300 cubic yards.

VI. Summary of Operable Unit Risks

As required by CERCLA, a risk assessment will be conducted based on characterization data obtained during the RFI/RI unit assessment following the interim action. This risk assessment will provide the risk analysis necessary to determine if additional remediation is warranted to protect human health and the environment. Development of future remedial actions will be contingent upon further characterization of the D-Area Oil Seepage Basin waste unit, delineation of the nature and extent of soil and groundwater contamination, analysis of associated risks, and the RCRA corrective action requirements.

Source Material of Concern. The D-Area Oil Seepage Basin operable unit, as defined herein, addresses as the source material of concern drum contents and large debris, pumpable free product or discernible layer of sludge, solid waste, and other principal threat source material. Groundwater and contaminated soil layers encountered during the interim action are beyond the scope of this interim action and will be addressed during the RI/FS process. The RI will further define the nature and extent of contamination and the media of concern in the waste unit. The future risk assessment will address risk associated with exposure pathways for each contaminated medium. It is not anticipated that airborne contamination or radioactive contamination will be a concern during the interim action.

Potential Chemicals of Concern. For the purposes of this operable unit, there are no potential chemicals of concern (COCs). Since the soils and groundwater are not addressed under this operable unit, there are no potential COCs for this action. Although there is contamination in the soil and groundwater at the D-Area Oil Seepage Basin, COCs will not be defined for these media during this action. COCs are defined for each environmental media by comparison of contaminant levels obtained during characterization activities to background levels, health-based action levels, and promulgated standards. COCs are also developed in conjunction with the remediation goals for the waste unit. Since soil and groundwater characterization is not part of this interim action, and PRGs have not been developed, there are no COCs for this operable unit. PRGs and COCs will be developed and defined during the RI/FS.

The threat source materials being acted upon during this interim action includes the waste oils in the drums, free product and sludges found in the trenches, and the removable debris. See Section VII for a detailed discussion regarding the quantity and types of waste expected to be removed. Types of contamination that may be encountered in the source material include PCBs, dioxins, volatile and semi-volatile organic compounds, and polynuclear aromatic hydrocarbons (PAHs). No radionuclide contamination is expected. This information is based on previous sampling activities. However, potential COCs for the soils, which are not addressed by this interim action, can be preliminarily identified based on comparison of detected contaminants to promulgated or proposed regulatory levels for constituents in the environment or to SRS-wide background levels (Tables 2 and 3). However, no conclusions concerning potential COCs can be made prior to performance of the risk assessment, which would take into account multiple contaminants and multiple exposure pathways and will be performed during the RI/FS.

Baseline Exposure Scenarios. The proposed interim remedial action would result in removal of principal threat source material. As a discrete action, the removal of drum contents would lessen the risk to both human health and the environment as leaching of drum contents to soils and/or groundwater would be reduced. Workers conducting the proposed interim action would be required to adhere to an approved Health and Safety Plan. Human exposure to waste materials in a disposal facility can occur only as a result of direct contact and transport via surface, subsurface, or atmospheric pathways. As part of the

RFI/RI assessment process, the risk assessment will develop and evaluate exposure scenarios.

Ecological Risks. The proposed interim action will alleviate some risk from further environmental impact through removal of drum contents. Drum contents may pose the most significant risk to the environment Removal of drum contents would reduce potential leaching of contaminants to surrounding environs. Identified baseline pathways which could potentially impact the environment will be evaluated during the RCRA/CERCLA process, following implementation of the proposed interim action.

VII. Description of Alternatives

Interim action alternatives were developed for the D-Area Oil Seepage Basin that would result in controlling impact to soils and/or groundwater at the unit. The alternatives presented in this IROD include:

! Alternative 1
No Interim Action

! Alternative 2
Buried Drum Content Removal with Soil Replacement and Limited Debris Removal and Disposition

The interim action altematives are described separately below. As required under CERCLA, the no action alternative, Altemative 1, is included in the evaluation as a baseline for comparison.

As mandated under the FFA, a full scale RFI/RI and CMS/CERCLA Feasibility Study (FS) will be conducted at the unit in the future. Final remedial alternatives will be developed as part of those activities.

The RFI/RI will begin in the fall of 1995 and a final remedial action selection will be made in approximately late 1998.

Alternative 1 - No Interim Action

Alternative 1 would include no interim removal activities. Drums, debris, and contaminated soils would be left in place at the unit. Potential continued impact of soils and/or groundwater could occur under this alternative and the continued presence of drums in the basin will interfere with planned assessment activities.

Treatment Components. No treatment would be implemented under Alternative 1.

Engineering Controls. No engineering controls would be executed under this alternative.

Institutional Controls. Access to SRS is controlled at primary roads by continuously manned barricades. Other roads entering the site are closed to traffic by gates or barriers. The entire SRS facility is surrounded by an exclusion security fence, except along the Savannah River. The SRS is posted against trespassing under Federal and state statutes. Road A-4.4 provides access to the D-Area Oil Seepage Basin and is currently not access controlled to onsite workers. Access to D Area is, however, restricted from the general public. No additional/new controls will be instituted.

Quantity of Waste. The D-Area Oil Seepage Basin is approximately 383 feet long, 108 feet wide, and 8 feet deep. The volume of material within these trenches, based solely on these dimensions, would be approximately 12,300 cubic yards. Based on interviews with site personnel, over 100 drums primarily containing waste oil have been disposed in the basin (WSRC, 1990). The volume of buried debris is assumed to equal 20 percent of the basin volume or 2500 cubic yards. The additional areas to be excavated of disturbed soil identified by GPR and magnetometer surveys is approximately 100 feet long by 50 feet wide and 75 feet long by 65 feet wide. It is not known whether waste materials are present in these areas and, accordingly, no specific waste volumes are estimated. However, assuming a depth of disturbance similar to the depth of the trenches, the total volume of material within the disturbed area would amount to approximately 3000 cubic yards. Under Alternative 1, all waste materials and drums would remain in place until a final

remedy is evaluated.

Implementation Requirements. This alternative is readily implementable.

Estimated Construction and Operation and Maintenance Costs. No costs are associated with implementation of this alternative.
ARARs Associated with the Considered Alternative. Applicable or Relevant and Appropriate Requirements (ARARs) ate Federal and state environmental regulations that establish standards that remedial actions must meet. There are three types of ARARs: (1) chemical-specific, (2) location-specific, and (3) action-specific. The three types of ARARs are described in detail in Section III.E. This section sets forth major ARARs associated with the remedial alternative.

No location-, action-, or chemical-specific ARARs are associated with Alternative 1.

The only potential chemical-specific ARAR for non-radioactive constituents in soils under Federal and South Carolina regulations was for PCBs. ARARs for PCBs are governed by the Toxic Substances Control Act (15USC §§ 2601-2671). For non-restricted access areas (e.g., residential), the PCB cleanup standard is 10 mg/kg by weight, provided that the soil is excavated to a minimum depth of 10 inches and that the excavated soil is replaced with clean sod (i.e., soil containing less than 1 mg/kg PCBs). However, since no PCB congeners or total PCBs in excess of 10 mg/kg were detected in soils and soil remediation is not part of this operable unit, this ARAR does not apply to the interim action for this unit.

Also, since no soil or groundwater treatment is being proposed, MCLs as an ARAR, and RCRA Subpart S as a "to-be-considered" factor, do not apply.

Alternative 2 - Buried Drum Content Removal with Soil Replacement and Limited Debris Removal and Disposition

Alternative 2 would involve an integrated sampling, analytical characterization, and drum content removal process. The objective of Alternative 2 would be to provide a drum-free waste unit which would allow subsequent investigations and complete physical and chemical characterization of the D-Area Oil Seepage Basin. The overall process under Alternative 2 would include uncovering of buried drums from the waste unit and transferring the drum contents to new drums for management by the on-SRS TSDF operated by SW&ER. Additionally, pumpable free product or discernible layers of sludge, solid waste, or other principal threat source material, not including groundwater or contaminated soil layers, encountered during the interim remedial action would be pumped or placed into new drums at the surface and managed by the TSDF operated by SW&ER. The interim action will adhere to all appropriate regulations. Specifically, and for the purpose of this interim removal action, drums, cans and other excavated containers will be termed as containers. These containers are defined as follows:

1. Partially Full or Full Containers
   a. Intact Containers - Excavated containers that are unbroken and still retain at least 75% of their original holding capacity shall be considered intact containers. Contents shall be transferred into new drums by practices commonly utilized for waste removal. Not more than 2.5 centimeters of waste (non-acutely hazardous) shall remain in the bottom of any intact container to be considered an empty container.
   b. Crushed/Degraded Containers - Excavated containers that are crumpled or crushed more than 25% and not easily emptied by practices commonly utilized to remove waste would be considered debris. Contents would be transferred into new drums by practices commonly utilized for waste removal.

2. Empty Containers (per 40 CFR § 261.7 and South Carolina Hazardous Waste Management Regulations R.61-79.261.7.b)
   a. Intact Containers - Excavated containers that are unbroken and that could still retain at least 75% of their original holding

capacity, and having not more than 2.5 centimeters of waste (non-acutely hazardous) remaining in the bottom shall be considered empty containers. Empty containers are not subject to regulation and can be land disposed.
b. Damaged/Degraded Containers - Excavated containers that would not satisfy intact container criteria, or are crumpled or crushed more than 25% would be considered debris.

3. Container Fragments would be considered as debris.

Management of debris is described further below. Appendix A provides a decision tree for the drum content management and debris management under the Alternative 2 process.

Excavation activities will begin at the western end of the "disturbed areas" and proceed sequentially in discrete sections. The top two to three feet of soil across the "disturbed areas" or trenches is assumed to be relatively clean. This top soil will be removed and placed adjacent to the excavation for later use as surface backfill. Excavation will continue with the remaining soil temporarily placed within the area of contamination, primarily on the previously identified disturbed areas. As the excavation proceeds through the disturbed areas, the contaminated soils will remain in the pit while continuously being displaced laterally as backfill. Excavation activities would not commence until the water table recedes to below 3 m bls (10 ft). Should groundwater infiltration occur during excavation, removal activities would be suspended until the groundwater recedes, and the regulatory agencies would be notified.

For the purpose of this interim removal action, debris shall be defined as Removable Debris or Non-Removable Debris.

1. Removable Debris:
a. shall be defined as debris that would be removed from the basin and dispositioned according to hazardous or non-hazardous debris determination using proper waste identification techniques.
b. shall include large, man-made materials visually located during the interim action removal activity such as damaged/degraded containers, metal piping, concrete, railroad ties, rubber materials and cable.
2. Non-Removable Debris:
a. shall be defined as debris mixed with soil that would be replaced with the excavated soil into the basin prior to completion of Alternative 2.
b. shall include basin aggregate (cobble); small man-made materials such as nails, broken glass, metal fragments, and other man-made materials visually located during the interim action removal activities.

Removable Debris encountered during Alternative 2 would be determined to be either hazardous or non-hazardous debris. This determination would be based upon all proper waste identification techniques utilized to determine hazardous constituents such as visual inspection, location, photo-ionization detection, organic vapor analyzation, total petroleum hydrocarbon field testing, Toxicity Characteristic Leaching Procedure (TCLP) testing of associated soils, and radiological scanning.

1. Hazardous Debris - Removable Debris determined through proper waste identification techniques to be hazardous shall be dispositioned through the TSDF operated by the SRS SW&ER. Appendix A provides the decision tree for management of debris.

2. Non-Hazardous Debris - Removable Debris determined through proper waste identification techniques to be non-hazardous can be land disposed.

Immediately following removal of drums, free product, limited debris, and/or the sludge layer at the bottom of the basins from the excavated section, the excavated soil will be placed into the excavation. The excavated soils will be backfilled into the previous excavation(s) until the soil is approximately one and one half feet below average grade. As drums, free product and/or limited debris are removed from the disturbed area, a corresponding void space will

result. At the end of removal activities, the void will be apparent at the eastern end of the trench in the form of a small pit. This pit will be lined, backfilled with clean soil, and covered with a polyethylene liner. The original top two or three feet of clean soil will then be returned to the top of the trenches. The area will be graded across the disturbed area and seeded to minimize rainwater infiltration and erosion.

Treatment Components. The interim action itself involves no treatment of soils or groundwater. Disposition of the drummed waste material and removable debris, which may involve treatment, would be managed through the TSDF operated by SW&ER following approved procedures (Appendix A).

Excavated drum contents, debris, and other principal threat source material characterized to be hazardous will be transported to the SRS-operated storage facility for hazardous and mixed waste. The SRS-operated storage facility is a RCRA-permitted facility that provides interim storage for hazardous waste until it is transported off-site for final disposition through one of several permitted hazardous waste TSDFs. Specific TSDFs will be determined at the time of disposal and be dependent upon characteristics of the hazardous waste.

Engineering Controls. Under Alternative 2, approximately 12,300 cubic yards of material (see Quantity of Waste) would be excavated from the basin. However, the two areas of disturbed soil would also be excavated and would increase the total volume of soil to be excavated to approximately 15,300 cubic yards. Upon uncovering drums during excavation activities, the drum contents would be transferred to new drums which would be stored in a temporary placement area. Drums, soils, and debris would be covered and secured at the end of a work day to prevent water from entering the placement area. Each area would be bermed and would be lined with a polyethylene liner. Runoff control would be accomplished by grading the ground surface prior to excavation such that stormwater would drain away from the excavation. A containment dike around the outer perimeter of the unit would be constructed to divert gradient runon. Erosion control fences would be established at the western extent of the unit to prevent erosion runoff toward the Carolina bay.

Institutional Controls. Public access to SRS is controlled by existing security personnel and security equipment as discussed under Alternative 1.

Quantity of Waste. Because neither the quantity of drums nor the volume of buried debris is known, assumptions must be made regarding the total number of drums and the number of drums containing waste product in the D-Area Oil Seepage Basin. For estimating purposes, it is assumed that at least 100 drums are buried at the D-Area Oil Seepage Basin (WSRC, 1990) and that 50 of these drums contain waste product. One hundred intact 55-gallon drums would occupy approximately 27 cubic yards. It is also assumed that the volume of buried debris is equal to 20 percent of the basin volume, or 2500 cubic yards, leaving approximately 9800 cubic yards of soil. The additional areas of disturbed soil detected by GPR may contain waste materials. Any materials uncovered during excavation of those areas would be managed as described for basin materials.

Implementation Requirements. Standard excavation equipment should be readily available for implementation of this alternative. New 55-gallon drums and materials needed for the staging areas are also readily available. Construction and removal activities are projected to require between three and six months, depending on the number of drums encountered, weather conditions, and other unpredictable factors. Plans are for the interim action to be initiated in early 1995. This proposed schedule meets the 15-month regulatory requirement for remedial action startup.

Estimated Construction and Operation and Maintenance Costs. The costs for Alternative 2 are estimated to be $1,400,000 (Appendix Table B.1). Costs include excavation and drum content sampling/analysis activities.

ARARs. Associated with the Considered Alternative. No location- or chemical-specific ARARs are associated with Alternative 2. As with Alternative 1, because no soil or groundwater treatment is being proposed, MCLs and PCB ARARs along with RCRA Subpart S as a "to-be-considered" factor, do not apply. Action-specific requirements for Alternative 2 include:

- Occupational Safety and Health Administration (OSHA) Regulations 29 CFR § 1926 - Excavations

- OSHA Regulations 1910.120 - Hazardous Waste Operations and Emergency Response
- OSHA Regulations 1910.146 - Permit Required Confined Space Entry

Land Disposal Restrictions regulations do not apply to any interim action activities conducted within the area of contamination.

Since the hazardous wastes generated during the interim action will be dispositioned off-site, as defined by 40 CFR § 300.5 of the NCP, SRS will comply with the Off-Site Rule (52 FR 49200). All applicable requirements will be met. Specifically, the off-site TSDF must comply with the Land Disposal Restrictions regulations. Prior to the transference of waste materials, EPA and SCDHEC will be notified of the specific receiving units and a full demonstration of compliance will be performed.

VIII. Summary of Comparative Analysis of Alternatives

The National Contingency Plan (40 CFR § 300.430(e)(9)) sets forth nine evaluation criteria that provide the basis for evaluating alternatives and subsequent selection of a remedy. The criteria are:

- overall protection of human health and the environment
- compliance with applicable or relevant and appropriate requirements (ARARs)
- long-term effectiveness and permanence
- reduction of toxicity, mobility, and volume through treatment
- short-term effectiveness
- implementability
- cost
- state acceptance
- community acceptance

Table 4 provides a summary of the considered alternatives in relation to the nine NCP criteria.

Overall Protection of Human Health and the Environment. Alternative 1 would not achieve any reduction in potentially unacceptable health risks posed by the D-Area Oil Seepage Basin. Alternative 2 would offer reduction in human health risk. Alternative 2 would involve an interim remedial action whereby buried drum contents and pumpable free product present within the basin would be withdrawn and properly managed. The alternative would include excavation of removable debris followed by proper management and disposition. Backfill would be graded and seeded to promote vegetative growth. The effect would be to control infiltration and inhibit migration of contaminants.

Environmental risks associated with D-Area Oil Seepage Basin would continue to exist under Alternative 1. Chemicals would continue to leach into the groundwater and the resulting contaminant plume will continue to migrate from the D-Area Oil Seepage Basin. Alternative 2 offers a reduction in risk to the environment. Alternative 2 would provide grading and seeding of backfill material to (1) control infiltration of precipitation, thereby minimizing contaminant migration; (2) prevent wind dispersion of contaminants; and (3) control erosion of soils.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs). The purpose of this interim action is to remove the source of contamination to soils and groundwater (i.e., buried drums). Removal of the drums from the basin will allow for performance of an RFI/RI unit assessment, which is essential for developing final remedial alternatives.

Table 4
Summary of the Comparative Analysis of Considered Interim Action Alternatives

NCP Criterion	Alternative 1	Alternative 2
Overall Protection of Human Health	No reduction in potential risk to human health	Reduces risk of exposure to drum contents
Overall Protection of the Environment	No reduction in potential risk to the environment	Reduces risk of further leaching of drum contents to soils and groundwater
Compliance with ARARs	No location- or action-specific ARARs associated with the alternative; meets identified chemical-specific ARARs	No location- or chemical-specific ARARs; action-specific ARARS include OSHA 29 CFR § 1926, 1910.120, and 1910.146
Long-Term Effectiveness and Permanence	Magnitude of risk would eventually reduce through natural attenuation mechanisms; however, initial risk would increase due to continued leaching of contaminants from buried drums	Offers permanent solutions to buried drum contents and large debris; risk to human health and the environment would be reduced
Reduction of Toxicity, Mobility, or Volume	Alternative 1 would offer no significant reduction of toxicity, mobility, or volume of contamination	Volume of drummed wastes, free product, and sludges significantly reduced; no reduction of contaminated soil.
Short-Term Effectiveness	Offers no mitigation of potential risks associated with direct exposure to contamination; poses no risk to remedial workers or the community upon implementation	Reduces potential risks to human health and the environment associated with direct exposure to drum contents through removal; risk to remedial workers controlled through adherence to an approved health and safety plan; no risk to community
Implementability	No implementation required	Requires no special or non-readily available equipment or materials
Cost	$0	$1,400,000
State Acceptance	State review of IAPP completed	State accepted alternative
Community Acceptance	Public comment period completed	Public accepted alternative

ARARs - Applicable or Relevant and Appropriate Requirements
OSHA - Occupational Safety and Health Administration
1926 - Excavations
1910.120 - Hazardous Waste Operations and Emergency Response
1910.146 - Confined Space Entry
IAPP - Interim Action Proposed Plan (WSRC, 1994)

Alternative 2 allows for the replacement of contaminated soils within the designated area of contamination. This interim action would be accomplished to allow the RFI/RI unit assessment to safely proceed.

No location-specific ARARs are associated with the alternatives; however, erosion control measures would be implemented during Alternative 2 to mitigate impact to the adjacent Carolina bay.

Action-specific requirements of Alternative 2 would be met through adherence to approved site-specific procedures and a health and safety plan.

Long-Term Effectiveness and Permanence. The magnitude of risk associated with Alternative 1 would diminish over time due to natural attenuation of D-Area Oil Seepage Basin constituents. Natural attenuation mechanisms include effects of adsorption, dilution, biodegradation, oxidation/reduction, and hydrolysis. However, conditions would deteriorate and potential risks to human health and the environment would increase anytime a drum containing pure waste product deteriorates and releases the waste into the environment. Many years would pass before natural attenuation of D-Area Oil Seepage Basin contaminants would reduce chemical concentrations to acceptable levels. Alternative 2 offers permanent solutions for the management of recovered drum contents and pumpable free product encountered during the excavation. The alternative offers the management and disposition of removable debris. Alternative 2 would offer the long-term benefit of significantly reducing potentially unacceptable risks associated with the D-Area Oil Seepage Basin. Alternative 2 would not result in removal of the entire source of contamination.

Following performance of a complete RFI/RI unit assessment, remedies could be developed which offer potentially greater effectiveness at a reduced cost. The objective of obtaining a drum-free environment in the basin to allow further assessment studies would be achieved under Alternative 2.

Reduction of Toxicity, Mobility, or Volume. The volume of drummed wastes, free product, and sludges at the D-Area Oil Seepage Basin would be significantly reduced under Alternative 2. The mobility of remaining contaminants would be minimized through grading and seeding to limit soil erosion and infiltration. Alternative 1 would offer no immediate reduction of contaminant toxicity, mobility, or volume. However, over time natural attenuation would be expected to occur.

Short-Term Effectiveness. Implementation of Alternative 2 would mitigate potential risks to human health associated with direct exposure to drum contents and free products at the D-Area Oil Seepage Basin. Soil used to backfill the basin would act as a protective barrier preventing access to underlying soil contamination. Alternative 2 would expedite the permanent removal of drums containing pure waste product from the basin. Additionally, removed debris under Alternative 2 would be excavated, characterized, and properly managed and disposed.

One drawback with regard to the short-term effectiveness of Alternative 2 is the potential increased human health risk associated with exposure to contaminants during excavation, treatment, and disposal of the buried drums and debris and the contaminated soil; however, adherence to an approved Health and Safety Plan and engineering controls would mitigate these effects.

Implementability. Alternative 1 does not require implementation. Alternative 2 is readily implementable requiring no special or non-readily available equipment or materials.

Cost. The cost associated with Alternative 1 is estimated to be $0. Costs for Alternative 2 are estimated to be approximately $1,400,000.

State Acceptance. The state has reviewed the IAPP and approved the selection of the preferred interim action remedial alternative.

Community Acceptance. Community involvement in evaluation of the proposed interim action has included a 60-day public comment

period and a public meeting held on October 11, 1994. Public comments were considered and incorporated into this IROD. Discussion of specific public comments and their resolution are included in the Responsiveness Summary (Appendix C).

IX. Selected Remedy

The preferred interim action remedial alternative is Alternative 2 - Buried Drum Content Removal with Soil Replacement and Limited Debris Removal and Disposition. The alternative consists of uncovering buried drums through excavation, transference of drum contents to new drums, and management of drum contents by the TSDF operated by SW&ER (Appendix A). Pumpable free product, or discernible layers of sludge, solid waste, or other principal threat source material, not including groundwater or contaminated soil layers, encountered during the interim remedial action would be pumped or placed into new drums at the surface and managed by the TSDF operated by SRS SW&ER. Removable debris at the surface would be characterized as either non-hazardous or hazardous and dispositioned through the TSDF operated by SW&ER (Appendix A). Immediately following drum, free product and/or limited debris removal from the excavated section, the excavated soil will be placed into the excavation. The soils will be placed in the excavation such that the most contaminated soils are at the bottom and the clean soils are at the surface. The excavated soils will be backfilled into the previous excavation(s) until the soil is approximately one and one half feet below average grade. As drums, free product and/or limited debris are removed from the disturbed area, a corresponding void space will result. At the end of removal activities, the void will be apparent at the eastern end of the trench in the form of a small pit. This pat will be lined, backfilled with clean soil, and covered with a polyethylene liner. The original top two or three feet of clean soil will then be returned to the top of the trenches. The area will be graded across the disturbed area and seeded to minimize rainwater infiltration and erosion. The combined results of Alternative 2 would be to remove a primary source of contamination and allow for future unit assessment studies essential for the development of final alternatives.

Within 15 days of the signing (approval) of the Interim Record of Decision (IROD), SRS will submit an outline for the post-IROD documents; the Remedial Design/Corrective Measures Design and Remedial Action/ Corrective Measures implementation Plans. The post-IROD documents will be submitted within 30 days after the outline is approved by EPA and SCDHEC. The interim remedial action will begin after the post-IROD documents are approved.

X. Statutory Determination

The preferred interim action remedial alternative for the D-Area Oil Seepage Basin operable unit, Alternative 2, addresses those principal threat source materials, which are liquid or concentrated hazardous substances that may readily migrate to subsurface soils and groundwater. Buried Drum Content Removal with Soil Replacement and Removable Debris Disposition. This interim action will be protective of human health and the environment, will comply with Federal and state ARARs, and will be cost effective. While partially fulfilling the statutory preference for remedies that reduce toxicity, mobility, and volume, some contaminated material will be left in place with this interim action alternative. Subsequent investigatory actions are planned to fully evaluate the risk to human health and the environment posed by the remaining contamination at the D-Area Oil Seepage Basin waste unit to determine the necessary final remedial actions for the unit.

XI. Explanation of Significant Changes

Based upon the recent installation of a network of piezometers and the ability to better monitor and track local groundwater conditions, the groundwater action level for commencement and continuation of excavation activities as defined under Alternative 2 has changed from greater than 10 feet bls to greater than or equal to 0.5 feet below the bottom of the basin

trench. Local groundwater conditions will be monitored with respect to the bottom of the basin trench during excavation activities. This change, and contingencies for various groundwater elevations, are outlined in Section 6.0, Contingency Plan Implementation Strategy of the Remedial Design/Remedial Action Work Plan for the D-Area Oil Seepage Basin, (WSRC, December, 1994).

XII. References

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EPA (U.S. Environmental Protection Agency), 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, Interim Final, EPA/540/G-89/004, Cincinnati, Ohio.

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Plunkett, R.A., 1993. D-Area Oil Seepage Basin Interim Removal Personnel Interview: Shepard Archie, CSWE (u), Memorandum, WER-ERC-930445, Westinghouse Savannah River Company, Aiken, South Carolina.

WSRC (Westinghouse Savannah River Company), 1990. RCRA Facility Investigation/Remedial Investigation Plan for the D-Area Oil Seepage Basin, WSRC-RP-90-704, Aiken, South Carolina.

WSRC (Westinghouse Savannah River Company), 1994. Interirn Action Proposed Plan, D-Area Oil Seepage Basin (U), WSRC-RP-93-703, Aiken, South Carolina.

APPENDIX A

IMPLEMENTATION AND WASTE MANAGEMENT STRATEGIES

ALTERNATIVE 2
IMPLEMENTATION STRATEGY

Interim Remedial Action:

Treatability Study

Soil Left In Place

Drum Content and Removable Debris Management

<IMG SRC 0495218C>
<IMG SRC 0495218D>

APPENDIX B

COSTS

Table B.1 D - Area Oil Seepage Basin
Westinghouse Savannah River Corporation
Alternative 2 - Drum Content Removal
Cost Estimate

Assumptions:

1) Suitable borrow material can be obtained onsite.
2) Necessary borrow material volume is 1,500 cubic yards (382' x 53' x 23').
3) Volume of drum contents, free product, and sludge removed...2750 gallons; (100 55 - gallon drums; 50% capacity)
4) Cover and liner material need only be overlapped...not welded.
5) 2 - Backhoes/1 - Frontend Loader/4 - Bobcats Used for Excavation

Item	Quantity	Units	Unit Costs($)	Total Costs($)
Capital Costs				
Site Preparation				
Chain Link Fence - 6 feet high; 6 ga. wire	1,400	Feet	12.39	17,346
Drive - thru Gate - 16 feet	1	Each	218	218
Construct Soil Staging Pad - 100'x 200'				
Barrier Liner Material - 40 mil Coaxil Liner	33,600	SF	0.19	6,384
Soil Bern - 2' High	45	CY	10	450
Cover Uner Material - 40 mil Coaxil Liner	40,000	SF	0.19	7,600
Construct Drum Staging Area - 60' x 60'				
Barrier Liner Material - 40 mil Coaxil Liner	3600	SF	0.19	684
Soil Bern - 2' High	18	CY	10	180
Cover Liner Material - 40 mil Coaxil Liner	10000	SF	0.19	1,900
Subtotal 1				34,762
Excavate Seepage Basin				
Unearthing Drums - Level C				
Mobilization	1	LS	2100	2,100
Equipment Rental	300	HR	850	255,000
Manpower	300	HR	420	126,000
Segregate Debris	1,000	CY	12	12,000
Subtotal 2				395,100

Waste Transfer & Removal				
Personnel - 6 People; 5 Drumss/Day; Level C	20	Day	5,000	100,000
Transportation - S Trucks	20	Day	135	2,700
Per Diem	20	Day	150	3,000
Misc. Expenses - Pumps, Hoses, Supplies, etc.	1	LS	20,000	20,000
New 55-Gallon Drums - 22 Gauge Composite	50	Each	45	2,250
Subtotal 3				127,950
Backfilling - Level D				
Barrier Liner Material - 40 mil Coaxil Liner	98,000	SF	0.19	18,620
Cover Liner Material - 40 mil Coaxii Liner	98,000	SF	0.19	18,620
Installation				
Personnel - 6 People; Level C	8	Day	5,000	40,000
Transportation - 3 Trucks	8	Day	135	1,080
Per Diem	8	Day	150	1,200
Misc. Expenses - Pumps, Hoses, Supplies, etc.	1	LS	2,000	2,000
Excavate and transport borrow soil				
Backhoe - 0.75 CY, wheel mont.	1,500	CY	3.50	5,250
Dump truck - 12 CY, 0.25 mi RT.	1,500	CY	2.00	3,000
Spread borrow material	1,500	CY	1.45	2,175
Subtotal 4				91,945

Table B.1 D - Area Oil Seepage Basin (Continued)
Westinghouse Savannah River Corporation
Alternative 2 - Drum Content Removal
Cost Estimate

Item	Quantity	Units	Unit Costs($)	Total Costs($)
Capital Costs (Continued)				
Sampling & Analyses				
TCLP (Full Scan)	60	Each	1,500	90,000
Flash Point	60	Each	33	1,980
PCBs	60	Each	250	15,000
Dioxin/Furan	6	Each	1,100	6,600
TOX	60	Each	50	3,000
RCRA Metals	60	Each	275	16,500
Gross Alpha	60	Each	45	2,700
Gross Beta	60	Each	45	2,700
Tritium	60	Each	45	2,700
Subtotal 5				141,180
Sampling & Analyses Labor				
Sampling - 3 Sampler: 3 Samples/Day: Level C	20	Day	2,500	50,000
Transportation - Truck	20	Day	45	900
Per Diem	20	Day	75	1,500
Misc. Expenses - Supplies	20	Day	450	9,000
Shipping - 3 Coolers/Day...$70/Cooler	20	Day	210	4,200
Subtotal 6				65,600
Total Capital Costs (Subtotals 1 - 6)				856,537
Operation & Maintenance (1 Year)				
Daily Inspection of Soil Piles - WSRC Employee	50	Day	90	4,500
Fence Repair	4	Qtr	300	1,200
Weed Control	4	Qtr	500	2,000
Total Annual O&M Costs				7,700
PRESENT WORTH O&M COST (30 YRS, i = 5%)				118,364
(Present Worth Factor = 15.372)				
Factored Costs				
Health and Safety	5 % of capital costs			42,827
Bonds, insurance	5 % of capitel costs			42,827
Contingency	15 % of capital costs			128,481
Engr./Const. Mgmt.	15 % of capital costs			128,481
Prime Contractor Ovrhd & Prft	10 % of capital costs			85,654
Total Factored costs				428,269
TOTAL PRESENT WORTH COSTS (Capital + O&M + Factored)				1,403,170

APPENDIX C

RESPONSIVENESS SUMMARY

General Response

During the 30-day comment period, a request for a public meeting was received (ref. letter to Mr. H. Horner from Ms. C. Lambert, 8/22/1994). The public comment period was extended an additional 30 days so the public meeting could be held. The public information meeting was held on October 11, 1994 in Aiken, South Carolina.

The public meeting was divided into three main segments: (1) a general introduction section, (2) a discussion about the proposed TNX groundwater interim action, and (3) a discussion about the proposed DAOSB interim action. The DAOSB discussion was broken into a general information and background segment, a discussion and question/answer session about the proposed interim action and finally an opportunity was provided for formal commenting. No formal comments were received at the public meeting.

During the general discussion, many question were asked about the interim action. Questions raised included general information questions regarding the physical state of the unit, how SRS was planning to remove the drums, a general discussion of what options were reviewed and evaluated and how SRS selected the preferred alternative. This discussion included a review of some of the options that were not presented in the IAPP. A main topic of the discussion centered around why SRS was replacing the soils and was not proposing to treat the excavated soils at this time. This question was also received as a formal written comment during the public comment period. The question and response can be found below.

SRS stated that many treatment and storage options were reviewed. The main drawbacks of treating the soil on site as an interim action were time and cost. SRS believes that the cost of constructing and permitting an on site treatment facility (or bringing in a portable treatment unit) would, at this time, not be cost effective. The nature and extent of contamination is not known. Based on the data available, the possibility exists that the soils may not warrant extensive treatment. On the other hand, if remedial investigation may determine otherwise, we may have to treat more soil during the final action, it would be more cost effective to wait and treat all the soils needing remediation at once. From the standpoint of time, it may take up to 2 years to bring in a treatment system, get it permitted and operational. By the time the system would be operational, SRS would be near completion of the RI/FS process. The treatment of the excavated soils is also out of the scope of the proposed interim action. Soil treatment is more of a final action. A final action will be completed following the expedited RI/FS. See the specific comments and responses for more detailed information.

Based on some of the discussions during the meeting and the comments received, it has become apparent that including the incineration alternative in the IAPP has clouded the primary purpose for proposing and performing the interim action. SRS agrees that the all or nothing approach to dealing with the basin soils was not consistent with the interim remedial action objectives. Therefore, alternative 3, excavation and incineration of basin soils, will be removed from the Interim Action Record Of Decision.

During the public information meeting, suggestions were received on potential improvements to the meeting format. These comments will be evaluated and to the extent possible, the recommendations will be followed. Opportunities to provide for earlier public involvement through coordination with the SRS Citizens Advisory Board (CAB) and/or holding public availability sessions are currently under consideration. It is the goal of the three parties to the FFA to address these opportunities in the next update to the SRS public involvement plan.

Written comments were received from the following sources and the responses are below.

Ms. Carrie Lambert (requested the public meeting)
Ridgeland, SC

RPM, Inc.
Mr. George Robinson, President
Aiken, SC

Energy Research Foundation
Mr. Tim Connor, Associate Director
Columbia, SC

Plasma Chem, Inc.
Mr. W. Paul Stephens, President
Atlanta, GA

SPECIFIC COMMENTS

Comment

Plasma Chem, Inc.
Mr. W. P. Stephens
8/16/94 letter to SRS Remedial Project Manager, EPA - Region IV

Plasma Chem recommends the use of their smelting process (Ausmelt Furnace) for the destruction of the waste material within the DAOSB trenches.

Response

SRS appreciates Plasma Chem's interest and suggestion, but since no treatment is being recommended at this time, the potential use of the suggested equipment is not appropriate for the interim action. SRS will evaluate the technology during the final RI/FS. Please note, the CERCLA process details the technologies to be used for remediation. Most of the time, especially with thermal technologies since there are many similar types of equipment in the market, the CERCLA does not specify specific brands of equipment. This is done through procurement.

Comment

RPM, Inc., 9/8/94
Ref. letter from G.C. Robinson, RPM, Inc.

"In the Savannah River Site Environmental Bulletin dated August 8, 1994 there is a release plan for the D-Area Oil Seepage Basin. After reading and evaluating the problem RPM believes we have possible innovative technologies that could be applied to the project allowing significant cost and time savings. Our approach would be to solidify the oil and sludge material into non-metallic containers and totally remediate the area...Realizing that the EPA and DOE are seeking innovative technologies to apply in solving environmental problems, RPM's method of cleaning up D-Area Oil Seepage Basin is a viable alternative to the three methods presented in the Environmental Bulletin.... "(ref. RPM letter)

Response

RPM's proposed innovative technology for remediating the D-Area Oil Seepage Basin (DAOSB) has been reviewed by SRS and at this time, it is believed to be inappropriate for the proposed interim action.

The proposed 'innovative technology' is in essence a basic stabilization technology that uses a unique container to receive the stabilized material.

From the point of view of stabilization, it may advantageous to stabilize the DAOSB material in place. Using the RPM method, the material would have to be removed, stabilized and then stored

or disposed in a permitted facility. The proposed stabilization method would require more handling (potentially posing more of a threat to human health) and potentially cost more than another stabilization process due to the cost of the containers and the storage or disposal cost (versus in situ stabilization). Stabilization has been proven to be somewhat ineffective on volatile organic compounds. Because the characteristics of the waste material are not fully defined, stabilization may not be needed; it is possible that only containerization is needed to store the material.

From a CERCLA standpoint, it is better to destroy and/or reduce the toxicity and/or the volume of material than it is to reduce its mobility. While most stabilization technologies increase the volume of material an average of about 30%, it appears that the RPM technology doubles the amount of waste material that must be stored or disposed. Other potential technologies exist for DAOSB that will treat/destroy the waste materials.

As part of the final CERCLA Remedial Investigation/Feasibility Study (RI/FS) process, in which a final remedial action will be chosen for the DAOSB, a full range of technologies, including destructive technologies and stabilization technologies, will be evaluated based on the CERCLA criteria. SRS is proposing only an interim action at this time, not a final action. Since the type and extent of waste in the basin have not been fully characterized, it may not be prudent, or cost effective, at this time to treat all of the basin soils.

When the final remedial actions are being developed and evaluated for the DAOSB, SRS will be pleased to fully evaluate RPM's technology.

Comment

Energy Research Foundation (ERF), 9/8/94
Mr. Tim Connor, Associate Director

1) While the excavation of the contaminated soils is necessary to remove the drums, it does not follow that they should be replaced in the manner described in Alternative #2.

It is plausible, based on the yet to be completed RFI/RI assessments (which presumably would incorporate future land use considerations combined with a more thorough risk assessment) that the ultimate closure plan will require either re-excavation of these soils or additional treatment of the soils in situ. Therefore the necessary excavation of the soils as part of the interim action presents an opportunity to either treat the soils and/or replace them in a way that greatly reduces their continuing threat to groundwater and their long-term potential threat to public health. If future treatment is necessary, then replacing the soils now would have the effect of making final remediation more expensive because of the potential need to re-excavate the soil for treatment or for the installation of a barrier beneath the soils to protect groundwater.

The preferred option would return contaminated soils to the ground in an unlined trench. The option also proposes that the most contaminated soils would be buried at the bottom of the trench where they are closer to the water table and more likely to come in contact with groundwater (which testing shows is already contaminated). Both facets of the re-burial are highly questionable. Because the interim action is justified, and the excavation of contaminated soils is an unavoidable action, we think this places an inescapable burden on SRS to show that the subsequent disposition of the contaminated soils does not re-introduce a potential groundwater contamination source to the site. Indeed, because the more contaminated soils would be placed closer to groundwater, the re-burial of the soils may make matters worse than they were prior to excavation.

Response

The treatment and/or storage of the basin soils will be addressed under ERF's comment #2.

From the standpoint of ex-situ remediation, the excavation of the soils, in most cases, is a relatively small cost compared to the cost of the associated treatment technology. Since the nature and extent of the contamination within the trenches and the DAOSB waste unit is not fully characterized, treatment and/or storage of excavated soils may not be needed and doing so may be very costly.

While placing soils back into the ground may appear questionable, SRS believes the preferred alternative will minimize the potential for continued groundwater contamination. SRS concedes that the IAPP may not be clear as to what specifically will be removed and how the material will be dispositioned. The IAPP proposed removing the drum contents, pumpable free product, discernible layers of sludge and other principal threat source material. SRS considers other principal threat source material to be the interval at the bottom of the trenches that is saturated with and contains free product. SRS will excavate the two main trenches to their respective bottoms, to a maximum depth of approximately 8 ft, and remove the bottom layer of basin soils seen to be contaminated with free product. SRS will not remove all the stained soils. The removed soils will be placed in B-25 boxes (special storage boxes), characterized for waste acceptance criteria and dispositioned according to applicable state and federal regulations through the SRS TSDF. The soils will be replaced into the excavation in a last-out-first-in fashion such that the cleaner soils will be toward the surface. A comprehensive remedial investigation will be conducted during the summer of 1995 which will include characterization of the vadose zone, the saturated zone soils and groundwater. From this, a risk assessment will then be conducted to determine the potential risk and help select a final course of action.

SRS believes that by removing the principal threat material at this time, the impact to groundwater will be minimized. Replacing the remaining potentially contaminated soils back into the excavation would at most minimally impact the groundwater. After being subjected to 20 years of groundwater fluctuations, it is unlikely that any contamination remaining in the replaced soils would migrate or leach to the groundwater. Based on limited soil sampling data, the majority of the mobile species of contaminants are not present at elevated levels in the basin soils. It is believed that the majority of the mobile species would be found in the free product and sludge layers and in the drums. It is unlikely that by performing this interim action and placing the soil back into the basin in a last-out-first-in fashion, SRS would be making matters worse than they were prior to excavation. Currently, the most contaminated soils, along with the free product and sludges, are closest to the groundwater. By performing the proposed interim action and placing the soils back in a last-out-first-in fashion, SRS would not be making matters worse but greatly decreasing the potential for further groundwater contamination.

Comment

2.) Because the projected cost of treating the excavated soils and debris is the problem with Alternative #3, ERF would like to see a more thorough assessment of the treatment/disposition options. Specifically, there should be more consideration given to options that would involve on-site treatment of the contaminated soils as opposed to transporting them to another site for incineration.

With respect to treatment options DOE's Office of Technology Development has, for example, initiated the Supercritical Water Oxidation (SCWO) Program for the treatment of mixed and hazardous wastes. in a February 1994 profile of the SCWO program OTD reported: "In contrast to incineration, SCWO can easily be designed as a full containment process with no release to the atmosphere (and) can achieve the high destruction efficiencies for hazardous waste such as polychlorinated biphenyls (PCBs) or dioxins" both of which are present in D-Area soils at levels in excess of RCRA Subpart S action guides. Other treatment options may also be available or under development that could substantially lower the costs of treatment.

Even if lower cost and adequate treatment technologies are not immediately available, consideration should be given to storing the soils in a readily retrievable form at least until a more thorough risk assessment is completed as part of the RFI/RI process. This could be done at a fraction of the cost of transporting and incinerating the soils. While it may preclude burial of the soils in the manner proposed in Alternative #2, it would not necessarily preclude burial of the soils at another location at SRS if this is compatible with RCRA and CERCLA regulations. It would also allow more time for the development of treatment options.

If storing the soils is inappropriate for some reason, then another alternative which might be considered is lining the basin before the soils are re-introduced. This would at least provide some additional protection while a final remedial action is selected.

Finally, storage and treatment alternatives could be considered for the most contaminated soils

as a less expensive alternative than storing or treating all removed soils. While not fully protective of public health and the environment, it might be preferable to the all or nothing approach outlined in the proposed plan.

Response

Per the NCP and CERCLA guidance for an interim action, only a limited number of alternatives need to be considered and in some cases perhaps only one. The alternatives considered must be within the scope of the interim action and not conflict with any potential final remedial action. The purpose of proceeding with this interim action is to achieve the interim remedial action goals and objectives of removing the principal threat source material (i.e. drum contents, free product and sludges) to minimize potential releases from the trenches.

Many treatment options, including both on site and off site treatments, other than the those included in the IAPP were reviewed. They included such treatments as in-situ bioremediation, soil washing, lining and capping the trenches, debris washing and super critical extraction/liquid phase oxidation to name a few. Most of the options were rejected, on an interim basis, due to inconsistency with the interim remedial action goals, implementability problems, cost and insufficient data regarding the nature and extent of contamination at the DAOSB. Also, one major factor for eliminating on site treatment was time. It would take well over a year to construct and permit an on site treatment facility and by the time it was operational, SRS would be close to completing the RI/FS process for the unit. The simplest method for on site "treatment" is to send the waste material to the on site TSDF for disposition. The disposition may include storage and or disposal through one of the TSDF disposal contracts. As described in the IROD all appropriate State and Federal regulations will be followed during the disposition of the hazardous materials removed.

Since it is currently not known whether the soils are characteristically hazardous or contain substances which require special treatment and handling practices, incineration was selected as the primary treatment option. Incineration represents the best available technology for many types of constituents, including PCBs, dioxins and furans.

It has become apparent that including the incineration alternative in the IAPP has clouded the primary purpose for proposing and performing the interim action. Incinerating the basin soils is more appropriate for a final action, and not the interim action. SRS agrees that the all or nothing approach to dealing with the basin soils was not consistent with the interim remedial action objectives. Therefore, alternative 3, excavation and incineration of basin soils, will be removed from the IROD.

The issue of replacing the excavated soils was discussed internally and externally at length. Options that included not replacing the contaminated soils and variations on replacing the soils were reviewed. By not replacing the soils an open pit would remain. Under this option, infiltration of rainwater could facilitate further groundwater contamination or cause it to spread faster. If the excavation was to be refilled with clean soils, there is the possibility that they would become contaminated due to the movement of the groundwater. While lining the excavation would prevent the spread of contamination into or out of the trench, it would allow the excavation to act as a pool for the infiltrating water. Adding a cover or a cap would prevent the pooling effect. But since the waste unit is not fully characterized, drilling through the liner and the cap would be necessary thus compromising the integrity of the cap and liner. Furthermore, a liner and cap may need to be removed for final remediation. Replacing the soils without a liner or cap and excavating them a second time for final remediation, if needed, would be cheaper.

SCWO is a promising innovative technology which has the ability to achieve organic destruction efficiencies of over 99.99% (DOE, 1994). SCWO is being developed to treat mixed waste streams at DOE facilities. At present, candidate mixed waste streams at DOE facilities include: spent solvent, oils, and other organic or aqueous liquids, sewage and organic laden sludges, spent carbon, solvent contaminated rags, and explosives and energetics (DOE, 1994). The current design of the SCWO unit is as a continuous process. The operating temperature and pressure of the unit (the critical point of water) would be 374 degrees Celsius and approximately 3000 psi.

No cost information is available for the SCWO technology. But based on similar technologies and the type of equipment required (high temperatures and pressures), SCWO may prove to be an

expensive technology.

Two other potential options for treating D-Area Oil Basin soils by SCWO is to: (1) manage the soils in a batch process or (2) extract the contaminants in an aqueous stream and subsequently treat the aqueous stream by SCWO. Batch processing of wastes is in the early stages of research and development. Extraction techniques have been established for organic contaminants and some full-scale extraction technologies are available. However, activities in the SCWO are in the pilot plant construction and testing phase. The testing milestone is expected to be completed by the end of 1995 (DOE, 1994). Full-scale operations for hazardous waste treatment has not been predicted. Treatment of soils from the basin by SCWO could require years to initiate. SRS will evaluate the SCWO technology and any other technologies suggested.

The ongoing RI/FS will fully evaluate an appropriate range of storage and treatment options. SRS would appreciate any further input for consideration during the final remedy selection.